REVIEWS.

The Principles of Pathology. Vol. I. *General Pathology.* By J. George Adami, M.D., LL.D., F.R.S., Professor of Pathology in McGill University, Montreal. Pp. 948; 322 engravings and 16 plates. Vol. II. *Systemic Pathology.* By J. George Adami and Albert G. Nicholls, M.A., M.D., D.Sc., F.R.S. (Can.), Assistant Professor of Pathology and Lecturer in Clinical Medicine in McGill University, Montreal. Pp. 1082; 310 engravings and 15 plates. Philadelphia and New York: Lea & Febiger, 1909.

Professor Adami's *Pathology* has from the date of its issue established a new standard for similar publications in America; and has lifted whatever opprobrium may have been fancied in the often repeated remark that there has been no American pathology (in the sense, of course, that the text-books of this hemisphere have followed more or less closely the thought, plan, and substance of European, notably German, authorities).

The first of these volumes, now in the second year after publication, has been widely studied; and expectancy has changed generally to cordial admiration for the breadth of fundamental discussion, the mode of presentation, and the clearness of expression of established knowledge, as well as for many of the personal views and applications introduced by the author. There have been numbers of excellent text-books issued from American presses which have not failed in matter of systematization of the subjects and in description of pathological processes and lesions; but in the endeavor to set cause to effect, to elucidate the rationale of events, and to explain the eternal "how and why" in the study of disease, the author's breadth of training and viewpoint, as well as his experience in long years of teaching, have combined to make the work notable.

A large part of this first volume is essentially preliminary, devoted to introductory consideration of the cell as a unit of vital organization, discussing the details of cellular structure and interrelation in complex organisms, our knowledge of the chemistry and physics of cellular activity, growth, multiplication, adaptation, and differentiation, and the data and problems of reproduction and inheritance. The essence of these chapters lies in the author's conception of the cellular protein molecules as elemental structures, biophores, the various phenomena of energy being referred to changes in these; the familiar side-chain theory being applied in explanation of their constitution and their changes in metabolism. This same idea is followed in the presentation of his views of cellular growth and differentiation, of adaptation, variation, and evolution, as well as the phenomena of inheritance. The more recent publication of Reichert and Brown upon the hemoglobins of the animal kingdom, while not directly related, will be found to lend considerable confirmation to Adami's view, in that the essence of distinction in evolution, and probably, too, in all vital phenomena, whether normal or pathological, must be carried back to molecular constitution. Such views are rapidly permeating our newer conceptions of biology, since the development of physical chemistry; and are bound in the near future to dominate medicine, just as in the past, one after another, the cellular pathology and germ theory of disease bore in upon us. That new cells developing from the original fertilized ovum grow by side-chain accretions to their molecules; come to differ, as slight differences in pabulum in diverse locations obtain; and progressively diverge as the diverging products modify more and more the side-chain construction of appropriating molecules, until the complete cellular differentiation of the body, with the harmonious interdependence and mutual resistance of its cells, is established—this is basic. The protoplasmic molecule of one cell is in its general structure like the protoplasm of a cell of a different organ, or like a cell of the same part from a different animal; and the differentiation in the individual, or the evolutional difference in different species, lies mainly in the side-chains, in their different qualities, valences, and affinities. The chromosomic theory of inheritance has never been entirely satisfying; but one can with Adami see under it in the possibilities of the chemical interaction of the complex biophores of the germ cells, a rational explanation for the dominance of one parental type, the chance for variations and mutations, and can see a reason for the only certain inheritance of acquired characteristics of the parents we know, that which follows those constitutional and toxic influences which may fixedly modify the molecular constitution of the germ cells, and in turn the progeny of these modified cells.

Thereafter, after discussion of antenatal acquirement, so often confused with true inheritance, the author devotes the remainder of the first part of the volume to the causes of postnatal acquirement of disease and the pathological processes which may logically be regarded as directly reactive or responsive to these—inflammation as a local reaction, infection with its general response in pyrexia and other phenomena, and the reactive immunity induced, as well as syncope, shock, and collapse as typifying failure of or negative reaction (death, however, being left to a subsequent section in the latter part of the volume). Of the chapters on pathogenic influences, including those of mechanical, physical, chemical, and parasitic natures, the more notable are devoted to the endogenous intoxications from internal secretory faults and faults of metabolism and to the effects of overstrain in structural and physiological sense, and to cellular disuse.

The chapters on inflammation, after the author's well-known plan of considering the subject in a comparative manner in the simpler organisms leading up to vertebrates in order to fix the essential features of the adaptive reaction, might well stand as a type of the methods pursued throughout the volume. Whatever the injury (and the author takes the safe ground that it is by no means always of microbic origin), the two prominent factors in the process are the proliferation of the cells about the injured area and the attraction of the wandering cells to the area, the role of the bloodvessels being strictly secondary in that it really but facilitates the former. One could suggest that with these basic factors more stress might be laid upon the entrance of excess of the body fluid into the area with its general and special influences toward removal of the cause of the process; and, too, many may miss in this luminous discussion a definitive presentation of the resolution of inflammation, aside from the matter of repair and the fate of the leukocytes and fibrin, for there are additional problems in the absorption of exudate and liquid waste, in the resumption of vascular tone and similar features. Ehrlich's side-chain theory is basic to the disquisition upon immunity; but the author is not bound rigidly to an immediate and essential chemism between the antigen and antibodies, realizing the possibilities of physical relations entering into the problems afforded by the recognized phenomena and well brought forward in the later trend of study.

In the second part of the volume the familiar progressive and regressive pathological changes of less definite relation or of unknown relation to cause are presented, the author breaking away from the common habit of introducing here, however, the hyperemias, ischemia, hemorrhage, thrombosis, embolism, and œdema, reserving these for the second volume in connection with the circulatory system. The line of discussion includes in the first group hypertrophy, regeneration, transplantation, metaplasia and the neoplasms; in the second, the atrophies, abioplasia, reversions, degenerations and infiltrations, necroses, and somatic death. In the descriptive part of each clearness and sufficiency, as may be expected, prevail; but, as in the first part of the volume, the notable features lie in the analysis of cause and relation and in the presentation, where this is impossible, of reasonable working theory. It is an open question as to the value of adding to existing morphological or relative classifications of the tumors; if it be granted, there are points of excellence in the author's separation of neoplasms into those of the lining (lepidoma) and those of the pulp tissues (hyloma), although it removes none of the difficulties in routine employment of Cohnheim's basic arrangement.

Whatever the cause of a tumor, Adami would hold there is assumed a peculiarity in its elements, not so much shown morphologically as in the predominance of a vegetative over the ordinary functionating character of the cell. Why such a character is assumed may be a matter of hypothesis, but there is reason to suppose that just as mutations in animals and plants are not mere chance, but determined more or less by alterations in environment, so it may be thought possible that cellular mutations of the type in question may by a variety of internal somatic conditions be determined, and there is no reason that stimuli of external origin, bacterial, chemical, or physical, may not do the same. He would look to no specific cause for tumors and seek for no parasite as definitely *neoformans.* The tumor cell itself is a modified body cell, and in its modification is the specific element (itself the antigen) and working out, the more atypical it is, its own antibodies from the somatic reaction to itself. Gaylord's work showing the development of immunizing substances in mice recovering from certain tumors, that of Jensen in inducing disappearance of tumor growth in mice by injecting into the animals the elements of a part of the tumor itself, as well as that of Coca along similar lines, and the recent announcement by Hodenpyl of a curative material for human cancer shown in the ascitic fluid of a cancerous human being, and other work of the same type, are all leading to a similar conclusion; and it is a safe prediction by the author that ultimate triumph over these growths is far from hopeless.

In the second volume, Prof. A. G. Nicholls collaborates with Adami. The association is valuable, no doubt, in a number of ways, but at the same time it leads to occasional lack of perfect harmony between the products of the two authors, the senior writer commonly presenting for each section an introductory portion dealing with the broad pathological problems in structure and physiological relation, and the junior author assuming the details of gross and minute anatomical description. Systemic pathology for its greater attractiveness should be presented in as fully applied form as possible, with frequent indication of the relation of the existing anatomical lesion with the symptoms manifested by the living subject, and with the distinct purpose of correlating with the primary lesions the secondary and complicating faults which invariably arise and, as a rule, prove in their combination the cause of death rather than the isolated primary lesion. Herein the authors are hampered by lack of space; and the fault in mind is not a qualitative but rather a quantitative one. It may be remedied in future editions by fuller discussion of the functional effects of at least the more important types of lesions, giving to classes of students a more certain habit of reasoning from a pathological basis in their clinical studies and at the same time insuring a more ready application of pathological knowledge by the practitioner. There is little reason for an elaborate description of this second volume, which follows through the diseases of the blood, cardiovascular and hemopoietic organs, respiratory and other systems of the body in regular order, each with excellent anatomical exposition of its important lesions and with sections upon the broader pathological physiology of each, which are as valuable from the infrequency of such discussions in works on pathology as from their intrinsic excellence.

If, as Professor Adami says in his preface, the book was twelve years in its forming, it is worth all the time and the effort. It cannot, of course, remain indefinitely fresh: there is too rapid progress for such expectation. But it has been shaped along lines which are permanent or at least look far into the future; and is certain for its many excellences to be long-lived by repeated revision without actual recasting.

A. J. S.

A TEXT BOOK OF PHYSIOLOGICAL CHEMISTRY FOR STUDENTS OF MEDICINE. By JOHN H. LONG, M.S., Sc.D. Second edition. Philadelphia: P. Blakiston's Son & Co., 1909.

THE subject matter of Dr. Long's book is divided into four sections: I. The Nutrients; II. Ferments and Digestive Processes; III. The Chemistry of the Blood, the Tissues, and Secretions of the Body, and IV. The End Products of Metabolism. In this edition a few changes have been made, notably the adoption of the protein classification recommended by American biological chemists, and a new chapter on the methods used in urine analysis.

One is rather appalled at the outset by being confronted with a sentence containing 134 words, of such involved construction and of such obscure meaning that if asked what he read, one might well reply with Hamlet, "Words, words, words!" The entire book while not guilty again of such verbosity, is nevertheless quite beyond the understanding of the medical student. Unless he is exceptionally well grounded in organic chemistry the book in many parts is incomprehensible, and the undergraduate who can read Chapters III and IV with an intelligent grasp of the subject is the fortunate possessor of unusual training and intellect. Chapter XIV, dealing with the complicated theme of special properties of blood serum, reflects great credit on the author. Dr. Long has presented this subject in a clear, concise, and easily understood manner, and the only adverse criticism that might be raised is that the author would have made his topic more clear had diagrammatic illustrations been shown. The chapter devoted to urinary examinations is hardly complete enough in detail for one to make even practical metabolic studies, and the index is very unsatisfactory. As a text-book the work is too lacking in explanation, and we fear the student will be unnecessarily confused by the at best recondite subject. As a laboratory book used in conjunction with practical demonstrations and intelligent instruction it may find a field of usefulness.

E. H. G.